ECONOMIC DETERMINANTS OF INDIVIDUAL CHARITABLE DONATIONS IN CANADA

by

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Introduction

This paper is made up of three parts; a theoretical discussion of individual decision making on charitable donations, an examination of the empirical evidence for Canada for the years 1968 to 1973 and an analysis of the implications of various proposals for the reform of tax legislation on charitable donations.

SECTION 1

Theoretical Overview

One can consider the potential donor to choose between own consumption/savings and donations subject to a budget constraint. Charitable donations are tax-deductible, hence the net cost of donating $1 (or the "price" of charitable donations) is $(1-T_m) \cdot \$1$ where T_m is the marginal tax rate. When tax rates are progressive and donations are tax-deductible, a diagram representing a donor's budget constraint will be, as in Figure 1, concave to the origin. A B C D E G′ is the budget constraint of a high income donor and A″ B″ C″ is that of a low income donor. Where additional donations cannot be deducted from taxable income (since the 20% ceiling has been exceeded or the marginal tax rate is zero--AB in the diagram) or where donations are not itemized (because the $100 "standard" medical/charitable deduction has not been exceeded--FG) donations "cost" their full dollar amount. The budget constraint then has a slope of -1. Elsewhere, the discrete tax brackets of our current tax system imply a schedule made up of flat segments whose slope is $\frac{-1}{(1 - T_m)}$.

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It has been suggested (e.g., Schwartz, 1970) that individuals derive well being from both giving and consuming, i.e., utility functions are defined over own consumption/saving (C) and consumption by the recipient (D). Hence a utility-maximizer's problem is:

(1) maximize $U = U(C, D)$ given $\frac{\partial U}{\partial C} > 0 \quad \frac{\partial U}{\partial D} > 0$

subject to

(2) $Y^G - t(Y^G - D - X) - C - D = 0$

Y^G, D and C are permanent income and the yearly flows of donations and of own consumption respectively; X represents other deductions and exemptions and t is the tax function.

One proposal for the reform of the tax laws is to allow donors to deduct 125% of their donations from taxable income. The effect of this is to alter the budget constraint (2) to

(3) $\phi = Y^G - T(Y^G - 1.25D - X) - C - D = 0$

(In Figure 1 this could be represented as a clockwise rotation of the budget constraint.) The extra deduction has effectively lowered the price of donating to charity and at any given level of donations the donor can consume $(.25)(MTR) \cdot D$ more than he could before.

A tax credit system where donors may deduct the value of donations (or a fixed percentage thereof) directly from tax payable is really just the same as if marginal tax rates were constant. It could be represented by a straight line budget constraint whose slope was $\frac{-1}{1 - T_c}$ where T_c is the tax credit rate chosen by government.

A government which wished to increase the receipts of private sector charities might consider a 'matching grants' scheme whereby it paid charities \$1 for each 'X' dollars raised privately. Since a \$1 donation (at a 'price'

of $(1 - T_m) \cdot \$1$) would now mean charitable receipts of $\$1 + \frac{1}{X}$, the individual donor would see such a scheme as implying a decrease in the 'price' of philanthropy. (From $1 - T_m$ to $(\frac{X}{X+1}) \cdot (1 - T_m)$.) Since the tax brackets of individuals are unaffected by this change, diagrammatically the budget constraint simply shifts up to G F′ E′ D′ C′.

A final policy alternative, that of abolishing the "standard" $100 medical/charitable donation, is more difficult to analyze. Diagrammatically the budget constraint becomes G′F E D C B A as income in the absence of donations decreases (by $\$100 \cdot T_m$) and the "price" of the first $100 of donations falls $(1 \rightarrow (1 - T_m))$. Clearly these changes have no impact on those taxpayers who are already itemizing donations (i.e., are in the region F E D C B A) but others (i.e., current non-itemizers) may either increase or decrease donations depending on whether income[1] or price effects dominate. In Section 3.3 we have assumed that the latter are zero and donations remain unchanged--i.e., that the very small donations of this group (less than $100 minus medical expenses) are made habitually, or to pay "social dues," and are not sensitive to price or marginal changes in income.

Wealthier individuals may feel a social responsibility as a result of their affluence and tend to want to give more at any given level of current income (i.e., have different tastes for donations). Mathematically one would have

$$(1') \qquad U = U(D, C, W) \qquad \frac{\partial U}{\partial D} > 0 \qquad \frac{\partial^2 U}{\partial D \partial W} > 0$$

Diagrammatically one would expect a shift of indifference curves upward and to the left.

Wealthy individuals also have in any given year the option of depleting their wealth and have, consequently, more possibility of making absolutely large donations. Should "increasing returns" exist in charitable donations,

either in the utility derived from community recognition of benefaction or from the social leverage that large patrons enjoy (e.g., Little Theatres) wealthy individuals could be expected to give more. Empirically, both these potential influences have the same result--a positive association of income from wealth and charitable donations. A proxy for wealth has therefore been included in the regressions which follow.

SECTION 2

Empirical Analysis - Individual Donations

The theory of Section 1 essentially refers to the decision problem of the individual donor/taxpayer. Micro-data on individuals are available in the U.S. and have been used to estimate the tax-responsiveness of charitable donations in several studies--notably Taussig (1967), Feldstein and Taylor (1975) and Feldstein et al. (1976a and b). The authors attempted to gain access to comparable Canadian micro-data but were not successful. One cannot therefore know if Feldstein and Clotfelter's (1976a) and Feldstein and Taylor's (1976b) findings for the U.S. are true also for Canada, i.e., that giving rises substantially with age and that donations of individuals do not appear to be responsive to others' donations.

The data source available for the current study was "Taxation Statistics" for the taxation years 1968 to 1973 as published by the Department of National Revenue. For each total income class (by thousand dollar increments) one can obtain total tax paid, total charitable donations claimed, total standard ($100) deductions claimed and the amount of income from various capital sources. Average itemized charitable donations in each income class i, in year t (D_{it})

can easily be calculated. The average price of charitable donations in that year and income group (P_{it}) is one minus the average effective marginal tax rate (i.e., one minus the average increment in tax paid between income intervals divided by the average increment in total income). Clearly $P_{it} = 1$ when no tax is paid and the separate reporting of non-taxable returns[2] at all income levels enables one to break the collinearity deadlock that otherwise would exist between income and marginal tax rate.

Ideally one would use measures of permanent income to estimate the income elasticity of charitable donations. In practice, current after-tax income must be used but it should be calculated as what after-tax income would have been in the absence of any donation since the actual tax paid is itself partially dependent on donations made. That is, Y_{it} = Gross income$_{it}$ - Income Tax$_{it}$ + $P_{it} \cdot D_{it}$. Since wealth holdings are not reported directly in "Taxation Statistics" the proxy K_{it}, the average percentage of total net income from all capital sources was used instead. A trend variable (T) was inserted to test the hypothesis that Canadian attitudes to private charity have been changing over time as governments have taken over more of its previous functions. Finally, since the years studied span the introduction of appreciable changes in the tax act, notably in the treatment of capital gains, the dummy variable (RF) was used to test the hypothesis that these reforms had in themselves altered the determinants of charitable donations.

The most basic formulation of the theory of Section 1 is that donations depend on current income and 'price'. That is

$$(1) \qquad D_{it} = F(Y_{it}, P_{it}) + \varepsilon_{it}$$

The work of Feldstein (1975a) and preliminary analysis of the data base led us to specify the constant-elasticity form of the relationship

$$(2\text{-}0) \qquad \ln D_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 \ln P_{it} + \epsilon_{it}$$

where ϵ_i is an unobservable residual reflecting random disturbances. In this specification, β_1 is the income elasticity of donations, β_2 the price elasticity of donations. A value $\beta_2 > 1$ implies that if the 'price' of donations were reduced, donations would increase by more than the loss in government revenue entailed; $\beta_2 < 1$ implies that where the 'price' of donations falls, not all of the tax-savings to individuals is passed on to charity.

Both income and donations were deflated to constant 1968 dollars and the following OLS results obtained, for taxpayers with total gross income less than $100,000.

$$(2\text{-}1) \qquad \ln D_{it} = \underset{\substack{(.071)\\((1653.9))}}{-2.88} + \underset{\substack{(.031)\\((471.7))}}{.675} \ln Y_{it} - \underset{\substack{(.144)\\((13.0))}}{.521} \ln P_{it}$$

$$\bar{R}^2 = .69 \qquad N = 248$$

$D_{it} \equiv$ average declared charitable donations in income interval i, in year t

$P_{it} \equiv$ (1 - effective marginal tax rate in income interval i), in year t

$Y_{it} \equiv$ Average Gross Income - Average Tax Paid in interval i, year t + $D_{it} \cdot P_{it}$

$K_{it} \equiv$ average percentage of total income coming from capital in income interval i, year t

$T \equiv$ trend 1968-1973

RF = 0 before tax reform

= 1 after tax reform (1972, 1973).

( ) denotes standard error of estimated coefficient

(( )) denotes F-value of estimated coefficient

# denotes variable not significant at 5% level of confidence.

As argued in Section 1, donations are likely to be a positive function of the proportion of income coming from wealth in that income interval.

For the specification

$$(3\text{-}0) \qquad \ln D_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 \ln P_{it} + \beta_3 \ln K_{it} + \epsilon_i$$

the following estimates were obtained

$$(3\text{-}1) \qquad \underset{\substack{(.093)\\((738.3))}}{\ln D_{it} = -2.54} + \underset{\substack{(.029)\\((516.7))}}{.675 \ln Y_{it}} - \underset{\substack{(.141)\\((23.7))}}{.692 \ln P_{it}} + \underset{\substack{(.038)\\((24.9))}}{.194 \ln K_{it}}$$

$$\bar{R}^2 = .72 \qquad N = 248$$

The data are, however, both cross-sectional and time series. This introduces three major complications: the allowance that must be made for 1) changes in tastes; 2) changes in institutional arrangements over the period studied and 3) the possible heteroscedasticity that is introduced in the pooling of cross-section and time series data.

Changes in tastes which occur gradually over time can most easily be thought of as shifting the entire donations schedule a little each year. The trend variable (T) was therefore entered separately.

The biggest institutional change introduced during the period was the 1971 Tax Reform whose most important feature was probably the introduction of a 50% capital gains tax. Such a change could be expected to have two sorts of effects on charitable donations. First, and most obviously, it reduces the net expected return on future capital gains. The permanent income hypothesis maintains that such a decrease in expected future income will entail changes in current consumption (and donation) plans. The tax reform, by decreasing future returns of wealth-holders, could be expected to decrease also their charitable donations.

A second influence could be expected to operate via the tangled effects which a capital gains tax has on the price of donations. P_i is the average donations price for members of income interval i and cannot completely summarize the effective price faced by all members of that group. Bird and Bucovetsky (1975) have pointed out that the gift of appreciated assets whose sale otherwise would be subject to capital gains tax can in some circumstances be a profitable undertaking. Average effective marginal tax rates would only partially reflect this change in the effective price facing particular individuals. One would therefore expect some change in the price elasticity of donations, although the evidence for such an effect would be weakened by the limited time over which taxable capital gains had accrued in the sample period (i.e., a maximum of two years from 'valuation day' in December 1971). Only that proportion of total accrued capital gains which has accrued since valuation day is subject to tax. Canada is thus in a transition period during which the current impact of the capital gains tax is slowly increasing as a higher proportion of total capital gains becomes subject to tax.

We hope that further research, with micro-data, will be able to unravel what is sure to become an increasingly important influence on charitable donations.

The 10% ceiling on charitable deductions as a percentage of income was not anywhere near a binding constraint for any income interval. The doubling of this ceiling on deductible donations in 1971 (to 20%) may have affected a very few individuals, but any changes in their behavior would be obscured, in the grouped data available, by the unchanging behavior of the vast majority.

Within the limited sample period it was not possible to break out these differential impacts of the tax reform (i.e., the interacted variables $RF^* K_{it}$, $RF^* P_{it}$, $RF^* Y_{it}$ were not in general statistically significant). The overall impact of the tax reform was, however, to decrease donations.

In estimating an equation such as (2-0) for a particular year, the assumption of homoscedasticity of the disturbance term (ϵ_i) can reasonably be made. Over the sample period many of the factors which contribute to ϵ_i may well change implying that the pooled data will be heteroscedastic although individual years may not be.[4] In this case the above estimates would be inefficient (Johnston, 1972, 214). Examination of the standard errors of the estimating equations run on each year individually (i.e., calculation of $\frac{S_i}{S_j}$ which is distributed as $F_{n-K_i, n-K_j}$ under the assumption of homoscedasticity (where S_i, S_j are the standard errors for years i and j)) reveals that this is probably the case.

The suggestion of Kmenta (1971, 511) of transforming the data matrix to remove heteroscedasticity by weighting individual year's observations

by the reciprocal of the standard error of the estimate of the regression run for that year alone, was therefore adopted.

The full relationship was then re-estimated, yielding:

$$(4\text{-}0) \qquad \ln D_{it} = \underset{\substack{(.757)\\((111.2))}}{-7.99} + \underset{\substack{(.038)\\((187.4))}}{.521} \ln Y_{it} - \underset{\substack{(.201)\\((18.3))}}{.862} \ln P_{it}$$

$$+ \underset{\substack{(.051)\\((82.4))}}{.462} \ln K_{it} - \underset{\substack{(.050)\\((1.67))\#}}{.065} T - \underset{\substack{(.222)\\((13.2))}}{.810} RF$$

$$\bar{R}^2 = .88 \qquad N = 248$$

These estimates we would consider to be statistically the more reliable and it is satisfying that they accord with our prior expectations.

The income elasticity of donations lies in the region of .52 implying that donations rise with income, although somewhat less than proportionately. A possible reason for this may be seen by examining the composition of charitable "targets" across income classes. "Charitable donations" include donations to religious institutions as well as to philanthropic and educational ones and such religious donations are a much higher proportion of the donations of lower-income than of higher income groups (Feldstein, 1975b, Bird and Bucovetsky, 1975). Given

1) the changing mix of donations by income levels and

2) the likelihood that some religious and charitable donations are akin to 'social dues' which are more or less fixed per capita in money terms, it is reasonable to expect that total donations will rise less than in proportion to gross income.

The variable D_{it} can be broken down into a) donations to religious institutions; b) donations to educational institutions; c) donations to welfare, cultural and other causes. Each of these is likely to have its own income elasticity (let us denote them as ϵ_R, ϵ_E and ϵ_W respectively) and they are likely to be quite different, as Feldstein (1975b) has noted. His study, with U.S. data, found ϵ_R, the elasticity of religious donations with respect to income to be almost certainly well below unity (the "social dues" hypothesis would hold it to be approximately 0), while ϵ_E and ϵ_W were found to exceed 1. β_1 is in fact a weighted average of ϵ_R, ϵ_W, and ϵ_E, the weights being the relative size of total donations to these various sectors. Canadian 'target' data, were they available, could be expected to reveal quite different relationships--particularly regarding ϵ_E. The American system of private colleges and universities dependent on endowment and alumni support does not exist in Canada. Donations to educational institutions are much rarer in our publicly funded set-up. Still, $\epsilon_R < 1$ is very likely true in both countries and one might expect to find $\beta_1 < 1$ in the current study, even were $\epsilon_W > 1$, $\epsilon_E > 1$.

The price elasticity of donations lies in the region of -.86. Our finding contrasts with that of Feldstein who found an elasticity of -1.15 to -1.17 (1976a and b). Feldstein's finding however, implies that when marginal tax rates are reduced, individuals will give away to charity even more than the amount of their tax saving, thereby ending up with less consumption goods than they had previously. This the authors find somewhat odd. An elastic

demand may be a reasonable finding for many goods but when the 'good' in question is in fact the consumption of others, it strains credulity. Moreover, Feldstein did not correct for heteroscedasticity in the pooled data. It seems more reasonable to believe that when tax rates are cut people keep some and give some away--which is confirmed by all specifications.

Direct measures of wealth were not available for this study. Attempts with this data base to estimate total wealth would require interpolation from reported dollar returns to capital--i.e., the imputation of rates of return and the questionable assumption that such rates of return are constant across income classes. The proxy (K_{it})--the proportion capital income was of total income--was used instead. One must note that the coefficient β_3 measures in a single coefficient the dual influences of changes in the budget constraint and possible changes in tastes. (3-1*) and (3-2*) imply that donations rise somewhat less than proportionately to increases in the percentage of total income coming from capital.

Although it is the least reliable estimate, there is some suggestion that the time trend of donations is negative. Some have argued that the positive correlation of age and donations found by Feldstein and Clotfelter (1976) is an indication of the greater private obligation felt by people reared when government programmes for the support of education or relief of misery were less prevalent. As their proportion of the population diminishes and as government programmes expand, one might expect the propensity to give to private charity to decline. This secular decline is normally offset to some extent by the increase in donations accompanying an increase in income. Equation (3-1*) corresponds to the direct relationship

$$(4\text{-}1) \qquad D_{it} = e^{\alpha} \cdot Y_{it}^{\beta_1} \cdot P_{it}^{\beta_2} \cdot K_{it}^{\beta_3} \cdot e^{\beta_4 T} \cdot e^{\beta_5 RF}$$

A β_4 value of .06 implies a fairly rapid decay of charitable urges in real dollars, but one which may be masked for a time by inflation-matching increases and a positive income elasticity.

The Tax Reform of 1971 was found to have the expected negative effect on charitable donations, most of which is surely due to the change in expected income from capital gains.

SECTION 3

Policy Proposals

3.1 Institution of 125% Deductibility

Martin (1975) has proposed that 125% of charitable donations be allowed as a deduction from taxable income. As outlined in Section 1, this would imply a shift outwards in the budget constraint facing individuals and one could expect donors to react to this decrease in the "price" of charitable donations by increasing donations. The change in "price" would clearly be greater, the higher the marginal tax rate faced by an individual taxpayer, hence the implementation of this proposal would have its greatest impact on the donations, and the tax savings, of upper income groups. In aggregate, the estimated price elasticity of .86, which by assumption was identical for all income groups, implies that the institution of 125% deductibility would, in 1973, have increased donations by itemizing taxpayers with incomes under $100,000 by roughly $30,000,000 (from $357,600,000 to $388,000,000). Government tax revenues could have been expected to fall by roughly $43,990,000.

This loss would have been apportioned among the federal and provincial governments in the same proportion as their shares of personal income tax. Table I illustrates the impact of such a reform on selected income intervals.

Table I

Illustrations of Impact of 125% Deductibility

	1973 Total Income Interval	Average Effective Marginal Tax Rate	Average Claimed Donations 1973	Expectable Changes in: Itemized Donations	Expectable Changes in: Tax Revenue
low income	7,000- 8,000	.21	295	+17	-20
medium income	11,000- 12,000	.27	355	+28	-33
high income	20,000- 25,000	.30	505	+46	-55
very high income	50,000-100,000	.42	1,642	+255	-306

Since the administration cost at the margin of collecting taxes is probably less than the marginal cost of charities' fund-raising, 125% deductibility may impose an efficiency loss on the economy relative to the option of directly allocating funds to charities. One must also expect excess deductibility to imply a somewhat greater revenue loss than a tax credit scheme to effect a similar change in charitable receipts.

A broader aim of the reform of regulations on charitable donations might be to broaden public awareness of the importance and role of private philanthropy. 125% deductibility could not be expected to broaden the social base for private philanthropy as appreciable changes in the dollar amount of donations really only occur among the very well-off; since these people are

such a small percentage of the population, the impact on public perceptions of charities is likely to be minimal.[5] If substantial numbers of individuals took advantage of the opportunity to donate appreciated assets (whose sale otherwise might have high transactions costs--e.g., art objects) or if some of the abuses of asset donation which have been described in the United States crept into Canada, then 125% deductibility might mean very large tax savings for a few high income individuals (if it were not restricted to cash donations). Such a result could well deepen public cynicism concerning charitable donations. Finally, one might note that 125% deductibility would widen, rather than diminish, the inequity of the existing scheme wherein a dollar's generosity of a poor man costs him more than the dollar's generosity of a rich man.

3.2 Institution of a Tax Credit Scheme

Institution of a tax credit scheme, whereby a specified percentage of total donations could be offset against income tax, would equalize the money cost of generosity across income classes. The 'price' of charitable donations would fall for low-income donors and rise for high-income donors. A tax credit rate could be chosen that would increase, decrease or leave unchanged the aggregate level of donations. As outlined in Appendix A, one can calculate the tax credit rate required for any desired increment in charitable revenues. A rate of 35% would produce approximately the same increment in charitable receipts as 125% deductibility. Table II presents simulations of other possible rates while Table III illustrates the expected impact on different income classes of a 35% tax credit.

Table II

	Aggregate Tax Revenue Change	Aggregate Donations Change
Tax Credit Rate of		
25%	+ 8,450,000	- 11,110,000
30%	-15,270,000	+ 10,150,000
35%	-41,110,000	+ 31,410,000
60%	-202,200,000	+137,700,000
90%	-465,650,000	+265,230,000
(34.7%	- 39,460,000	+ 30,015,000)

Table III

Illustration of Impact of 35% Tax Credit Scheme

	1973 Total Income Interval	Current 'Price' Donations	Reformed 'Price'	Donations	Expectable Change in: Itemized Donations	Tax Revenue
low income	7,000-8,000	.79	.65	295	+ 45	-137
medium income	11,000-12,000	.73	.65	355	+ 33	- 40
high income	20,000-25,000	.70	.65	505	+ 31	- 35
very high income	50,000-100,000	.58	.65	1,642	-170	+175

Most tax credit schemes involving feasible amounts of tax revenue loss would, however, imply an absolute decline in the receipts of some charitable organizations. Donations by upper-income groups can be expected to fall while those of lower-income groups rise. Lower-income groups give a higher proportion of their donations to religious organizations than do upper-income groups (Bucovetsky and Bird (1975)), hence these institutions could be expected to benefit from a tax-credit system. Available Canadian data do not permit us to estimate the price elasticities appropriate to each income interval disaggregated by charitable sector but one can, in general, forecast that institution of a tax-credit scheme will shift the proportional division of charitable revenue towards those charities favoured by low and middle income donors. Unless the tax-credit is very large those charities heavily dependent on upper income groups are likely to find that their share of the general increase in donations is less than the past donations of their previous patrons. The 125% deductibility scheme, since it produces the greatest 'price reductions' for the highest marginal tax groups, would have the opposite effect--i.e., it would increase the proportionate share of charities favoured by upper income groups.

3.3 Matching Grants

A relatively direct way for government to assist the private philanthropic sector would be to give it money. This could be done on a "matching grants" basis where government undertook to pay registered charities $1 for every "X" dollars privately raised by charities and itemized on individuals' income tax forms. It was not possible for the authors to

estimate the administrative costs of such a proposal but it could be expected that the lack of bureaucratic discretion implied might also reduce very considerably the bureaucracy required. One would hope that the application of a mechanical matching-grants rule could be a relatively low-cost by-product of the current system of auditing and processing income tax forms.

In addition a "matching-grants" scheme and continued tax deductibility of donations would imply an equiproportionate $(\frac{1}{X+1})$ change in the cost of philanthropy faced by all itemizing taxpayers. If the rate chosen were \$1 per \$10 privately raised, individuals would become aware that a \$1 donation produces \$1.10 in benefits for their favourite charity, at a cost to themselves of \$1 · (1 - their marginal tax rate). The cost of passing \$1 to one's favourite charity has, in this example, fallen by $1/11 \cdot P_i$. The desired increase in charitable receipts (ΔM_i) corresponding to such a fall in price can be found as outlined in Appendix A. Since, however, part of these receipts by charities are paid by government, individuals will not have to pay all of what their charity receives--private donations will now be $D'_i = 10/11(D_i + \Delta M_i) < D_i$.

In order to increase charitable receipts by \$30,000,000 (comparable to 125% deductibility or a 35% tax credit) a matching grants rate of \$1 per \$9.25 (10.8%) would be required. Such a scheme would entail a government revenue loss of \$35,735,000 (see Appendix A), which compares favorably with the cost of the other proposals examined.

3.4 Elimination of the Standard \$100 Deduction

One can, from available sources, obtain data on the donations of people who itemize their charitable donations but no data exist regarding the donations of those who take advantage of the 'standard' \$100 medical/charitable deduction. One must presume that most people who use this

deduction do so because it is advantageous to them--i.e., their combined allowable medical expenses and charitable donations are less than $100. Such people are found in most all income intervals and clearly constitute a very different population than that of itemizers.

In estimating the impact of eliminating the standard deduction one would like to know the response of this population to the changed price (from 1 to 1-marginal tax rate) of donations they would face. One does not, however, have available any data on their charitable donations with which to estimate this response and it would seem unwise to assume that the elasticities estimated for the population of itemizers in Section 3 can be generalized to the population of non-itemizers. The assumption of constant elasticities made in Section 2 enables approximate estimates to be made of behavior over much of the demand curve for charitable donations but it would seem unwise to push this assumption too hard. Donor behavior at either extreme of the distributions of income or of gifts is not likely to be well captured by such an assumption, although aggregate behavior may well be. [It is for this reason that in Section 2 we have restricted attention to taxpayers with incomes under $100,000.]

The assumption of no net change in the donations of non-itemizers was therefore made--i.e., it was assumed that the small donations of this group are made habitually or to pay 'social dues' and would not be changed appreciably if they were claimed explicitly as deductions (at a lower implicit donations 'price'). To be specific, we assume a zero price elasticity of donations for the population of non-itemizers.

Should the standard deduction be eliminated, government tax collection costs might be expected to increase to the extent that the now-claimed donations of previous non-itemizers are audited. Government tax revenue would also increase, for a 'typical' taxpayer in income interval i by $T_i(100 - D_i)$ where D_i is the value of receipts submitted by the taxpayer and T_i is his marginal tax rate. Clearly, the impact one expects on government revenue depends on the assumption one makes as to D_i. The authors have simulated the results of four assumptions regarding D_i:

1) D_i is not a function of Y_i and $\simeq \$50$

2) D_i is a linear function of $Y_i (D_i = \alpha Y_i)$ $\min D_i = 0$ $\max D_i = 100$

3) D_i is a nonlinear (quadratic) function of $Y_i \left(D_i = \left(\frac{Y_i}{Y_{max}}\right)^2 \cdot 100\right)$

4) D_i is a nonlinear (square root) function of $Y_i \left(D_i = \left(1 - \left(\frac{Y_i}{Y_{max}}\right)^{\frac{1}{2}}\right) \cdot 100\right)$

The change in government tax revenue as a result of abolishing the standard is $G = \sum_{i=o}^{max} S_i T_i(100 - D_i)$ where S_i is the number of non-itemizers in income interval i. The income distributional impact of such a change depends on:

a) the dollar value to an individual in income interval i of the current tax break (i.e., $T_i(100 - D_i)$);

b) the number of individuals in that income interval who are currently using the standard deduction (S_i).

Clearly, the dollar value of the standard deduction is greater for individuals in higher tax brackets but less if they give almost $100 anyway. Also, fewer people in higher income intervals take advantage of the standard deduction.

The aggregate benefits to non-itemizers in income interval i of the current standard deduction is $S_i \cdot T_i(100 - D_i)$. If these benefits increase more than proportionately to the total income of income groups, the current scheme is 'progressive' in its incidence (greater benefits to the well-off); if these benefits are a constant proportion of total income, the current scheme is fiscally neutral; if they decrease as a proportion, the current scheme is 'regressive'. Table IV summarizes the impact on government revenue of abolition and the current distributional incidence of the $100 deduction under assumptions (1) to (4).

Table IV

Assumption	Relative Incidence of Tax Benefits From Standard Deduction	Tax Loss Implied by $100 Standard Deduction ($000,000)
(1) $D_i = 50$	benefits lower income groups	71
(2) $D_i = \alpha Y_i$	benefits higher income groups	138
(3) $D_i = \left(\frac{Y_i}{Y_{max}}\right)^2 \cdot 100$	benefits lower income groups	143
(4) $D_i = \left(1 - \left(\frac{Y_i}{Y_{max}}\right)^{\frac{1}{2}}\right) \cdot 100$	benefits lower income groups	117

Conclusions

It appears that individual charitable donations in Canada are responsive to their implicit 'price' as defined by the tax system. Indeed, one indirect impact of the institution of the 1971 tax reform may have been a decrease in individual charitable donations. Both income and price elasticities were found to be statistically significant but the 'price' elasticity of Canadian charitable donations was found uniformly to be less than one, both in simple OLS regressions and when correction was made for the heteroscedasticity introduced in the merge of consecutive years of cross-sectional data.

The results obtained indicate that the charitable sector of Canada differs very appreciably from that of the U.S., hence the several American studies available ought not to be simplistically extended to Canada. Charitable donations of Canadians per capita are about one-third of those of Americans (Bird and Bucovetsky 1975, 9). Some differences in individual responses must necessarily be present when the aggregate results are so strikingly different. The authors were therefore not surprised to find that their estimates of the income and price elasticities of individual donations are considerably less than those published in the American studies.

If government desired to increase the revenues of private charities one option is 125% deductibility of donations. The chief drawbacks of such a scheme would be its widening of the existing inequity in the cost of giving as between rich and poor donors and its greater cost in foregone tax revenue to achieve a given increase in charitable revenues.

A tax credit scheme could be designed at a rate around 28%) at which one could expect minimal changes in both aggregate tax revenues and aggregate donation--but such a rate would imply a shift in real income from high income to low income taxpayers and, probably, a shift in the destination of donations. Tax-credit schemes, since they can be expected to increase

the percentage of charitable donations coming from lower-income groups will also increase the percentage going to religious institutions. Charitable organizations now heavily dependent on the wealthy would face difficult times under such a regime. Some rates of tax credit could be expected to yield quite large increases in aggregate donations, but at the cost of even larger losses in government revenues.

Of the three schemes examined, the 'matching-grants' proposal appeared to be the most 'efficient' way for government to transfer tax revenues to the private charitable sector. In addition it might be expected to produce the least disturbance in the proportionate receipts of charitable organizations.

The current $100 standard medical/charitable deduction can be seen as an increase in the basic exemption from tax, which is selectively enjoyed. Its abolition, under most reasonable assumptions, would increase the inequality of distribution of national income, but result in a substantial increase in tax revenue.

We would hope that further research in this area will clarify the determinants of Canadian corporate donations and examine the neglected areas of foundation and bequest generosity. We would suspect that in the future large individual donors will pay even closer attention to the tax provisions regarding donations of appreciated capital assets but micro data on individual behavior are probably required before such changes in personal donations can be adequately analyzed.

Footnotes

[1]Donations are found in Section 2 to be a normal good for itemizers.

[2]On average it appears that non-charity deductions and exemptions were responsible for non-taxable status. Even for the exceptional very large donors, the price at the margin of donations is approximately unity.

[3]We have in addition run all regressions listed using Y'_{it} as the income variable--with very little change in any of the results.

[4]We are indebted to R.A.L. Carter for pointing out to us both this problem and its solution.

[5]In 1973, 1.4% of Canadian families had total income in excess of $35,000. Income Distributions by Size in Canada 1973, Statistics Canada 13-207.

References

Andrews, F. Emmerson (1956) Philanthropic Foundations (New York: Sage Russell Foundation).

Bird, Richard and Meyer Bucovetsky (1975) Canadian Tax Reform and Private Philanthropy (The Canadian Tax Foundation).

Dickinson, Frank G. (ed.) (1962) Philanthropy and Public Policy (New York: National Bureau of Economic Research).

Dickinson, Frank G. (ed.) (1970) Changing Position of Philanthropy in the American Economy (New York: National Bureau of Economic Research).

Feldstein, M. (1975a) 'The Income Tax Charitable Contributions Part I, Aggregate and Distributional Effects,' National Tax Journal XXVIII, March.

Feldstein, M. (1975b) 'The Income Tax and Charitable Contributions Part II, Impact on Religious Educational and Other Organizations,' National Tax Journal XXVIII, June.

Feldstein, M. and Charles Clotfelter (1976a) 'Tax Incentives and Charitable Contributions in the United States: Microeconomic Analysis,' Journal of Public Economics, 5, No. 1, January/February.

Feldstein, M. (1976b) 'The Income Tax and Charitable Contributions,' Econometrica, 44, No. 6, p. 1201, November.

Feldstein, M and A. Taylor (1975) 'Income Tax and Charitable Contributions: Estimates and Simulations with the Treasure Tax Files,' Harvard Institute of Economic Research Discussion Paper.

Johnston, J. (1960) Econometric Methods (New York: McGraw-Hill Book Co.).

Kmenta, Jan (1971) Elements of Econometrics (New York: Macmillan Publishing Co.).

Martin, Samuel A. (1975) Financing Humanistic Service (Toronto: McClelland and Stewart Ltd.).

Schaefer, Jeffery M. (1968) 'Philanthropic Contributions: Their Equity and Efficiency,' Quarterly Review of Economics and Business 8, No. 2.

Schwartz, Robert A. (1970) 'Personal Philanthropic Contributions,' Journal of Political Economy, 78, No. 6, November/December.

Schwarts, Robert A. (1968) 'Corporate Philanthropic Contributions,' Journal of Finance, June.

Taussig, Michael K. (1967) 'Economic Aspects of the Personal Income Tax Treatment of Charitable Contributions,' National Tax Journal, XX, No. 1, March.

Taxation Statistics, Revenue Canada, 1968 through 1975.

Appendix A

From the definition of price elasticity we know

$$\varepsilon_p = \frac{\Delta D_i}{\Delta P_i} \cdot \frac{P_i}{D_i} \quad [= -.86 \text{ from (4-1)}]$$

$$\Delta D_i = [(-.86)(\Delta P_i)(D_i)]/P_i .$$

Notation:

N_i = number of donors in income interval i

D_i = average donations in income interval i

ΔD_i = change in average donations in income interval i

$TD = \sum_i N_i D_i$ total donations all individuals

$\Delta TD = \sum_i \Delta D_i \cdot N_i$ change in total of all private donations.

For the three schemes under consideration:

a) $\Delta P_i = -(\beta-1)(1-P_i)$ where $\beta = 1 +$ excess percent of donations deductible

b) $\Delta P_i = (1-TC-P_i)$ where T.C. is the tax credit rate chosen.

c) $\Delta P_i = -P_i/(X+1)$ where the government matching grant is \$1 for each "X" dollars private raised.

An increase of "M" dollars in charitable receipts arises because:

a) $$M = \Delta TD = \sum_i N_i \Delta D_i = -\sum_i N_i((-.86)(\beta-1)(1-P_i)(D_i))/P_i$$
$$= .86(\beta-1)(\sum_i N_i D_i + \sum_i N_i D_i/P_i).$$

b) $$M = \Delta TD = \sum_i (N_i(.86)(P_i + TC - 1)D_i/P_i$$
$$= .86(\sum_i N_i D_i + (TC-1)\sum_i N_i D_i/P_i).$$

c) $$M = \sum_i (N_i(-.86)(-1/(X+1)\cdot P_i \cdot D_i)/P_i = (+.86/(X+1))\sum_i N_i D_i$$
$$= +.86\ TD/(X+1)$$

since, in 1973 measured in \$ 000,000

$$TD = \sum_i N_i D_i = 357.6$$

$$\sum_i N_i D_i / P_i = 494.35$$

$M = 30$ implies $\beta = 1.255$ or $TC = .347$ or $X = 9.25$

The associated revenue losses are

currently $R = \sum_i N_i T_i D_i = 95.13$

where $T_i = 1 - P_i$

under excess deductibility a).

$$R_a = \sum_i N_i T_i \beta(D_i + \Delta D_i)$$

$$= \beta \sum_i N_i T_i D_i + (\beta-1)\beta(.86)\sum_i N_i T_i^2 D_i / P_i$$

since $\sum_i N_i T_i^2 D_i / P_i = 70.01$

$\beta = 1.255$ implies $R_a = 139.12$

under a tax credit scheme b).

$$R_b = TC(TD + \Delta TD)$$

if $TC = .347$ $R_b = 134.59$

under a matching grants scheme c) where D_i' is the new level of private donations

Gross cost of the matching grant scheme is

$$R_c = \frac{1}{X} \sum_i N_i D_i' + \sum_i N_i T_i \cdot (D_i')$$

$$D_i' = \frac{X}{X+1} \left[D_i + \frac{.86 D_i}{X+1}\right]$$

if $X = 9.25$, $R_c = 130.85$

List of Equations

Section I

(1) maximize $U = U(C,D)$ given $\frac{\partial U}{\partial D} > 0$, $\frac{\partial U}{\partial C} > 0$

(2) $Y^G - t(Y^G - D - X) - C - D = 0$

(3) $\phi = Y^G - T(Y^G - 1.25D - X) - C - D = 0$

(1') $U = U(D,C,W)$ $\frac{\partial U}{\partial D} > 0$ $\frac{\partial^2 U}{\partial D \partial W} > 0$

Section 2

(1) $D_{it} = F(Y_{it}, P_{it}) + \epsilon_{it}$

(2-0) $\ln D_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 \ln P_{it} + \epsilon_{it}$

(2-1) $\ln D_{it} = \underset{\substack{(.071)\\((1653.9))}}{-2.88} + \underset{\substack{(.031)\\((471.7))}}{.675 \ln Y_{it}} - \underset{\substack{(.144)\\((13.0))}}{.521 \ln P_{it}}$ $\quad \bar{R}^2 = .69 \quad N = 248$

(3-0) $\ln D_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 \ln P_{it} + \beta_3 \ln K_{it} + \epsilon_i$

(3-1) $\ln D_{it} = \underset{\substack{(.093)\\((738.3))}}{-2.54} + \underset{\substack{(.029)\\((516.7))}}{.675 \ln Y_{it}} - \underset{\substack{(.141)\\((23.7))}}{.692 \ln P_{it}} + \underset{\substack{(.038)\\((24.9))}}{.194 \ln K_{it}}$

$\bar{R}^2 = .72 \quad N = 248$

(4-0) $\ln D_{it} = \underset{\substack{(.757)\\((111.2))}}{-7.99} + \underset{\substack{(.038)\\((187.4))}}{.521 \ln Y_{it}} - \underset{\substack{(.201)\\((18.3))}}{.862 \ln P_{it}} + \underset{\substack{(.051)\\((82.4))}}{.462 \ln K_{it}}$

$- \underset{\substack{(.050)\\((1.67))\#}}{.065\, T} - \underset{\substack{(.222)\\((13.2))}}{.810\, RF}$ $\quad \bar{R}^2 = .88 \quad N = 248$

(4-1) $D_{it} = e^{\alpha} \cdot Y_{it}^{\beta_1} \cdot P_{it}^{\beta_2} \cdot K_{it}^{\beta_3} \cdot e^{\beta_4 \cdot T} \cdot e^{\beta_5 \cdot RF}$

Section 3

Contains 5 equations in text of section 3.4, i.e.,

1) D_i is not a function of Y_i and $\simeq \$50$

2) D_i is a linear function of $Y_i (D_i = \alpha Y_i)$ min $D_i = 0$ max $D_i = 100$

3) D_i is a nonlinear (quadratic) function of $Y_i \left(D_i = \left(\frac{Y_i}{Y_{max}}\right)^2 \cdot 100\right)$

4) D_i is a nonlinear (square root) function of Y_i $\left(D_i = \left(1-\left(\frac{Y_i}{Y_{max}}\right)^{\frac{1}{2}}\right) \cdot 1\right.$

The change in government tax revenue as a result of abolishing the standard is

$$G = \sum_{i=o}^{max} S_i \, T_i (100-D_i)$$

where S_i is the number of non-itemizers in income interval i.

Appendix A

Is almost entirely equations.


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